EUROPEAN COMMISSION
Information Society and Media Directorate General

Lisbon Strategy and Policies for the Information Society
Lisbon Strategy and i2010

Use of Computers and the Internet in Schools in Europe 2006

Country Brief: Iceland

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Key findings

All Icelandic schools now use computers for teaching and have internet access. A very high 92% use the internet via a broadband connection. With this figure Iceland ranks at number 5 of the 27 countries participating in the survey. There is very little variation between school types

80% of Icelandic classroom teachers had used computers in class in the 12 months prior to the survey, with little variation across school types and between urban and rural areas. The share of intensive ICT users is much higher in secondary and vocational schools, where it reaches figures above 70%. Only in primary schools do just over one third of teachers use ICT in class.

Icelandic teachers rely very heavily on existing online material from established educational sources (87% compared to an EU25 average of 74% resulting in rank 2 in Europe).

There is no difference in ICT use according to age of teachers in Iceland (indicator used here: years of teaching experience).

20% of teachers do not use computers in class in Iceland. When asked for the most important barrier, half of the teachers state that their subject does not lend itself to being taught with the use of ICT.

Icelandic teachers have a very positive attitude about the use of ICT in class and the associated benefits which can be achieved. Only 1% of all teachers and a very low 7% of those not using ICT are not convinced of any benefits of using computers in class. Also only 6% express the opinion that teachers lack the necessary skills to utilize computers in their teaching (which is the second best result in Europe) and the same number states that there is a lack of interest in ICT among teachers.

Icelandic teachers are positive about the different applications of ICT use in teaching and achieve high figures (well above the European average) on attitudes that ICT should be used.

Only 35% wish there were better ICT support and maintenance actions taken. This is by far the lowest figure in Europe and demonstrates the very good level of ICT equipment and related service provision in Icelandic schools.

With a surprising only 18% of the teachers belonging to the group of teachers who dispose of sufficient access to the internet at school, the necessary competence in using ICT in class and are motivated to its use, Iceland ranks in second last position in Europe. The situation is poorer only in Latvia.

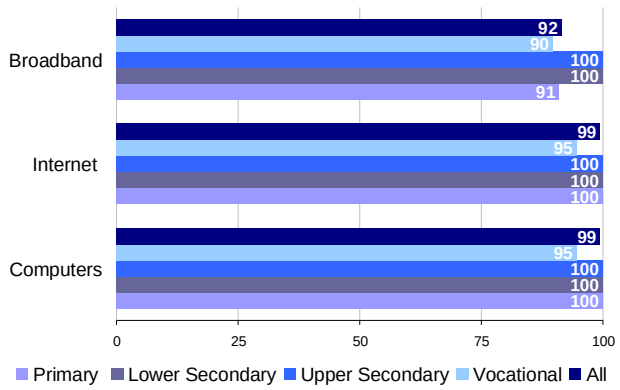
Icelandic teachers also seem to be very competent in using ICT in class. The corresponding figure for Iceland is more than twice as high as the European average and by far the highest in Europe.

ICT access does not constitute a problem in Iceland. However, lack of motivation of teachers does. A very high (the highest in Europe) 37% of teachers with the necessary ICT access and ICT skills are not motivated to its use in class, based on the calculations of the ACM model. However, one should treat these results with some caution, due to several reasons stated below in this document.

ICT Equipment and Internet in Schools

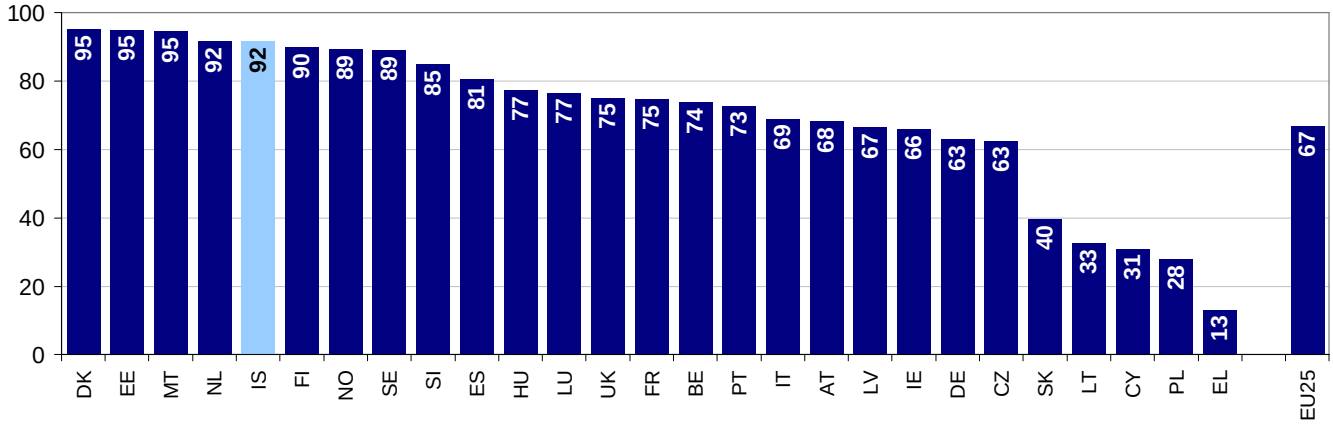
All Icelandic schools now use computers for teaching and have internet access. A very high 92% use the internet via a broadband connection. With this figure Iceland ranks at number 5 of the 27 countries participating in the survey. There is very little variation between school types: while 90% of primary schools and vocational schools have a broadband internet connection, the penetration is at 100% in all secondary schools.

Percentage of Schools Using Computers, Internet Connection, and Broadband Internet Access According to School Type in Iceland 2006



Source: *LearnInd HTS 2006;* ***Base:*** *All schools;* ***Question:*** *Computers: Q6; Internet, Broadband: Q9. See questionnaire for exact wording.*

Percentage of Schools with Broadband Internet Access in Europe 2006



Source: *LearnInd HTS 2006;* ***Base:*** *All schools;* ***Question:*** *Q9. See questionnaire for exact wording.*

There is also some variation with regard to broadband access between more densely populated areas and rural areas, with the former being better equipped with broadband access.

94% of schools have a website, 96% offer e-mail to teachers, and 36% do so to pupils.

80% of the Icelandic schools using computers for teaching use them in classrooms, which puts Iceland only at rank 14 with the lowest percentage being achieved in primary schools (79%).

Computers in the school library are more popular in Iceland than in many other countries and mostly provided in almost two thirds of the secondary schools.

Those schools with a broadband connection to the internet are much more likely to have a more sophisticated ICT infrastructure including a school website, the use of a LAN or the availability of an intranet. Schools with broadband access are twice as well-equipped in this respect compared to those with narrowband access to the internet.

The use of Computers and the Internet in Schools

Computers are used for various purposes and as part of teaching different subjects in schools but also and very widely as a separate subject.

Computer sciences are taught as a separate subject in 86% of Icelandic schools, and in more than 90% of upper level schools. ICT is fully integrated in the teaching of most subjects in 79% of schools; again, the upper level schools reach figures around and above 90%.

80% of Icelandic classroom teachers had used computers in class in the 12 months prior to the survey, with little variation across school types and between urban and rural areas. For most teachers, this includes not only using a computer for presentation purposes but also the use computers by pupils in class.

ICT equipment in Icelandic schools 2006

			Educational Level (IS)				Type of locality (IS)			Internet Access (IS)	
	Total IS	Total EU25	Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated	Narrow-band	Broadband
Computers per 100 pupils [a]	15.3	11.3	14.5	*14.3***	*17.3**	*18.8**	N/A	14.9	15.9	*18.1**	15.3
... of which internet connected	14.8	9.9	14.1	*14.3***	*17.2**	*17.6**	N/A	14.2	15.6	*17.3**	14.7
Percentage of schools having...											
Computers for teaching [b]	99.5	98.7	100.0	*100.0***	*100.0**	*94.6**	N/A	98.7	100.0	*100.0**	100.0
Internet access [c]	99.5	96.2	100.0	*100.0***	*100.0**	*94.6**	N/A	98.7	100.0	*100.0**	100.0
Broadband internet access [d]	91.5	66.9	91.0	*100.0***	*100.0**	*89.7**	N/A	98.7	86.8	*0.0**	100.0
A website [e]	93.6	63.0	92.9	*100.0***	*100.0**	*94.6**	N/A	98.7	90.3	*59.8**	97.1
An e-mail address for the majority of teachers [f]	96.1	65.2	96.8	*77.3***	*100.0**	*94.6**	N/A	96.8	95.6	*93.2**	96.9
An e-mail address for the majority of pupils [g]	35.6	23.5	26.9	*77.3***	*83.9**	*69.4**	N/A	54.5	23.2	*13.4**	37.7
A LAN [h]	64.7	55.2	59.6	*77.3***	*100.0**	*89.7**	N/A	64.8	64.7	*26.8**	68.4
An intranet [i]	73.7	40.8	72.8	*61.3***	*92.2**	*79.2**	N/A	76.3	72.0	*47.1**	76.4
An external support or maintenance contract [j]	59.7	47.1	64.0	*16.0***	*50.2**	*37.7**	N/A	44.7	69.6	*60.5**	60.0
Percentage of schools using computers for education in…											
Computer labs [k]	84.1	80.5	82.8	*100.0***	*91.4**	*88.3**	N/A	92.0	79.0	*53.9**	86.7
Classrooms [l]	67.7	61.4	71.9	*38.7***	*47.9**	*34.8**	N/A	74.7	63.3	*59.5**	68.4
School library [m]	49.3	33.4	47.1	*61.3***	*65.5**	*58.1**	N/A	63.6	40.2	*13.4**	52.4
Other locations accessible for pupils [n]	39.7	27.0	37.1	*77.3***	*47.4**	*46.0**	N/A	46.3	35.6	*39.5**	39.8

Source: *LearnInd HTS 2006;* ***Base:*** *a: all pupils; b-j: all schools, k-n: schools using computers for educational purposes for pupils (cf. index b);* ***Question:*** *a: Q4, Q6, Q7; b: Q6; c: Q9; d: Q9; e-j: Q12; k-n: Q8. See questionnaire for exact wording.* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases; "xx.x** " based on less than 10 cases. No densely populated areas existing in Ireland.*

Use of computers in class in Iceland 2006

Assessments of the head teacher		Total IS	Total EU25	Educational Level (IS)				Type of locality (IS)			Internet Access (IS)	
				Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated	Narrow-band	Broadband
Computer sciences taught as separate subject	Agree	85.7	54.7	86.5	*54.6***	*91.7**	*94.8**	N/A	85.2	86.1	*80.5**	86.2
	Disagree	14.3	43.7	13.5	*45.4***	*8.3**	*5.2**	N/A	14.8	13.9	*19.5**	13.8
	Don't know	0.0	1.6	0.0	*0.0***	*0.0**	*0.0**	N/A	0.0	0.0	*0.0**	0.0
Computers and the internet are												
integrated into teaching of most subjects	Agree	78.9	75.3	78.4	*54.6***	*91.3**	*89.0**	#NV	80.4	77.9	*80.5**	78.8
	Disagree	20.6	24.1	21.6	*45.4***	*4.3**	*5.2**	#NV	18.2	22.1	*19.5**	20.6
	Don't know	0.5	0.6	0.0	*0.0***	*4.4**	*5.8**	#NV	1.4	0.0	*0.0**	0.6
used for teaching traditional subjects or basic skills	Agree	80.2	75.8	81.5	*77.3***	*74.5**	*72.3**	#NV	83.5	78.0	*73.9**	80.7
	Disagree	18.2	22.8	17.3	*22.7***	*21.2**	*21.9**	#NV	13.8	21.1	*26.1**	17.5
	Don't know	1.6	1.4	1.3	*0.0***	*4.3**	*5.7**	#NV	2.7	0.9	*0.0**	1.7
used for teaching foreign languages	Agree	90.5	56.6	89.2	*100.0***	*100.0**	*94.8**	#NV	93.5	88.7	*80.7**	91.4
	Disagree	9.5	40.1	10.8	*0.0***	*0.0**	*5.2**	#NV	6.5	11.3	*19.3**	8.6
	Don't know	0.0	3.3	0.0	*0.0***	*0.0**	*0.0**	#NV	0.0	0.0	*0.0**	0.0
used for teaching students with special needs/ handicaps	Agree	94.8	71.7	96.1	*100.0***	*87.4**	*94.8**	#NV	98.7	92.2	*87.5**	95.4
	Disagree	5.2	23.7	3.9	*0.0***	*12.6**	*5.2**	#NV	1.3	7.8	*12.5**	4.6
	Don't know		4.6	0.0	*0.0***	*0.0**	*0.0**	#NV	0.0	0.0	*0.0**	0.0

Source: *LearnInd HTS 2006;* ***Base:*** *All schools using computers for educational purposes for pupils;* ***Question:*** *Q13: "To what extent do you agree or disagree with the following statements regarding the educational use of computers and/or the internet in your school?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases; "xx.x** " based on less than 10 cases.*

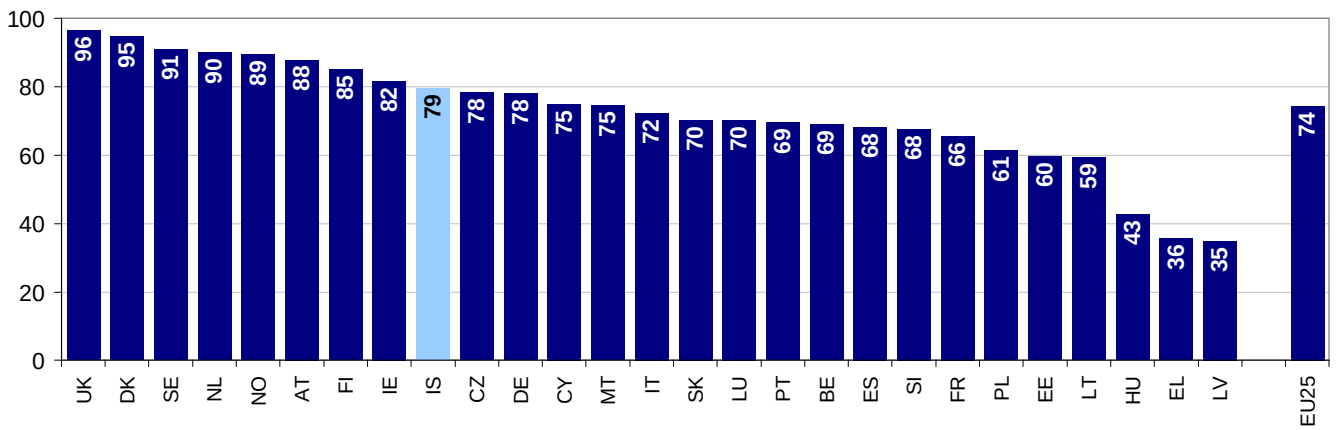
In terms of ICT usage frequency and intensity by teachers it becomes apparent that there are two rather equal groups, one of less intensive users (ICT use in up to 10% of lessons) which amounts to 36% of Icelandic teachers and another one of very intensive users (ICT use in more than 50% of the lessons) which is slightly higher with 41%. In between we find a group (23%) with medium ICT usage intensity. The share of intensive ICT users is much higher in secondary and vocational schools, where it reaches figures above 70%. Only in primary schools, do just over one third of teachers use ICT in class.

Icelandic teachers using computers do not restrict themselves to a particular source of information but use a multitude of different material from a variety of sources for teaching purposes, which in most categories is slightly below the European average. With some exceptions, Icelandic teachers rely on existing online material from established educational sources (87% compared to an EU25 average of 74%, resulting in rank 2 in Europe), are not using CD ROMs as intensively as teachers in all other countries (56% compared to an EU25 average of 83% resulting in rank 27 in Europe) and are also less intensively searching for material themselves on the internet (69% compared to an EU25 average of 83% resulting in rank 26 in Europe).

There is no difference in ICT use according to age of teachers in Iceland (indicator used here: years of teaching experience). Depending on the age group, between 37% and 47% of the teachers use ICT in class in more than half of their lessons. With these figures, Iceland ranks around the European average in terms of ICT usage, frequency and intensity.

20% of teachers do not use computers in class in Iceland. When asked for the most important barrier, half of the teachers state that their subject does not lend itself to being taught with the use of ICT. This reason is stated more often by teachers in lower level schools. The second most important barrier is lack of computers (36%) which is significantly lower than the European average of 49%.

Percentage of teachers who have used computers in class in the last 12 months (2006)



Source: *LearnInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *Q7. See questionnaire for exact wording*

Teachers' use of computers in class in Iceland 2006

Percentage of teachers who ...	Total IS	Total EU25	Educational Level (IS)				Type of locality (IS)			Years of teaching experience (IS)			
			Primary	Lower secon-dary	Upper secon-dary	Voca-tional	Densely popu-lated	Inter-mediate	Thinly popu-lated	<5 y	5-9 y	10-19 y	20+ y
...have used computers in class[1]	79.5	74.3	78.6	*84.7**	84.2	*83.3**	N/A	76.9	81.3	75.9	86.5	82.0	71.6
...use a computer in class to present or demonstrate	74.8	63.4	72.9	*84.7**	84.2	*83.3**	N/A	76.4	73.6	67.5	81.1	77.3	70.6
...have pupils use a computer in class	66.0	66.3	67.2	*61.6**	59.6	*66.7**	N/A	57.9	72.0	60.2	73.9	70.3	56.8

Source: *LearnInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *Q7 "How have you used computers and/or the internet for work in the last 12 months?"*

Frequency of computers use in class in Iceland 2006

Percentage of all teachers *using computers in class* who ...	Total IS	Total EU25	Educational Level (IS)				Type of locality (IS)			Years of teaching experience (IS)			
			Primary	Lower secon-dary	Upper secon-dary	Voca-tional	Densely popu-lated	Inter-mediate	Thinly popu-lated	<5 y	5-9 y	10-19 y	20+ y
...use computers in 5% and less of all lessons	16.6	18.5	19.6	*0.0**	*4.2**	*3.3**	N/A	20.0	14.3	16.1	13.7	20.4	15.5
in 6 to 10% of lessons	19.3	22.5	21.5	*18.1**	*8.3**	*6.7**	N/A	22.3	17.3	17.7	13.7	20.4	26.8
in 11 to 24% of lessons	23.3	22.2	24.9	*9.1**	*16.7**	*16.7**	N/A	16.9	27.6	29.1	25.3	22.4	16.9
in 25 to 50% of lessons	25.2	20.2	24.9	*45.5**	*22.9**	*23.3**	N/A	24.6	25.5	19.3	27.4	25.5	26.8
more than 50% of lessons	15.6	16.5	9.0	*27.3**	*47.9**	*50.0**	N/A	16.1	15.3	17.7	20.0	11.2	14.0

Source: LearnInd CTS 2006; **Base:** Teachers using computers in class, "don't know" answers excluded; **Question:** Q9 "For what percentage of time have you used computers and/or the internet in class when teaching your main subject(s) in the past 12 months?" ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Source of educational material used in class in Iceland 2006

Percentage of all teachers *using computers in class*[2] who ...	**Total IS**	**Total EU25**	**Educational Level**				**Type of locality**		
			Primary	**Lower secondary**	**Upper secondary**	**Vocational**	**Densely populated**	**Inter-mediate**	**Thinly populated**
...use material they have searched the internet for	69.1	82.7	66.3	*63.6**	*85.4**	*86.7**	N/A	62.8	73.5
...use existing online material from established educational sources	87.3	74.2	90.2	*81.9**	*70.8**	*66.7**	N/A	84.7	89.0
...use material that is available on the school's computer network or database	71.2	63.1	70.6	*81.7**	*70.8**	*66.7**	N/A	76.6	67.5
...use electronic offline material (such as CD ROMS)	56.4	83.0	54.3	*54.6**	*66.7**	*63.3**	N/A	53.3	58.5
...use other learning material when using computers in class	2.7	8.8	2.5	*0.0**	*4.2**	*6.7**	N/A	2.9	2.5

Source: *LearnInd CTS 2006;* ***Base:*** *Teachers using computers in class;* ***Question:*** *Q10 "Which of the following types of materials have you used when teaching your main subject(s) with the aid of a computer and/or the internet?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Barriers to computer use in class in Iceland 2006

Percentage of all teachers ***not*** *using computers in class*	**Total IS**	**Total EU25**	**Educational Level**				**Type of locality**		
			Primary	**Lower secondary**	**Upper secondary**	**Vocational**	**Densely populated**	**Inter-mediate**	**Thinly populated**
Lack of computers	35.6	48.8	36.0	*0.0***	*33.3***	*33.3***	N/A	*39.0**	*32.6**
Lack of adequate content/material	3.5	20.3	4.0	*0.0***	*0.0***	*0.0***	N/A	*2.5**	*4.4**
Lack of content in national language	3.5	8.6	4.0	*0.0***	*0.0***	*0.0***	N/A	*2.5**	*4.4**
Lack of adequate skills of teachers	5.7	22.5	6.7	*0.0***	*0.0***	*0.0***	N/A	*2.4**	*8.7**
No or unclear benefits	6.9	16.2	4.0	*0.0***	*33.3***	*33.3***	N/A	*4.9**	*8.7**
Lack of interest of teachers	5.7	8.9	6.7	*0.0***	*0.0***	*0.0***	N/A	*0.0**	*10.9**
Subject does not lend itself to being taught via computers	49.4	24.4	50.7	*100.0***	*33.3***	*33.3***	N/A	*58.6**	*41.3**
Other	5.8	21.3	6.7	*0.0***	*0.0***	*0.0***	N/A	*7.3**	*4.4**

Source: *LearnInd CTS 2006;* ***Base:*** *all teachers not using computers in class;* ***Question:*** *Q12: "Why do you not use computers and/or the internet when teaching in class?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases; "xx.x** " based on less than 10 cases.*

This results in a situation where the statement “lack of equipment in school” is expressed by only 7% of all Icelandic teachers (20% non-users multiplied with 36% of teachers agreeing to this item).

Icelandic teachers are very positive towards the use of ICT in class and the associated benefits which can be achieved. Only 1% of all teachers and 7% of those not using ICT are not convinced of any benefits of using computers in class. Also only 6% express the opinion that teachers lack the necessary skills to utilize computers in their teaching (which is the second best result in Europe) and the same number states that there is a lack of interest in ICT among teachers.

Attitudes on the Usefulness of ICT use in Teaching

Computers and the internet have arrived in Icelandic schools and are used quite intensively. The share of teachers in Iceland – but also in the European Union in general – who believe that computers and the internet should not at all be used in schools, is very low but with 2% in Iceland twice as high as the European average.

Icelandic teachers have positive attitudes about the different applications of ICT in teaching and achieve high figures (well above the European average) on attitudes that ICT should be used for letting pupils do exercises and practise (81%), letting pupils retrieve information in a self-directed manner (90%) and for collaborative and productive work by pupils (73%). There are only small differences across school types.

A large majority of Icelandic teachers (77%) still believe that teaching about office tools should be an integral part of the teaching process. With this figure the country ranks 3rd in Europe. This attitude is most prominent among teachers in primary schools (78%). It is interesting that there is no common pattern across the European countries. In most countries teachers in higher level schools express this opinion much more strongly and to a larger extent compared to primary schools.

Attitudes on the Usefulness of ICT use in Teaching in Iceland 2006

Percentage of teachers saying computers/internet should be used for …	Total IS	Total EU25	Educational Level				Type of locality		
			Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated
Letting pupils do exercises and practise	81.4	79.9	82.9	*84.6**	70.2	*72.2**	N/A	78.7	83.3
Letting pupils retrieve information in a self directed manner	90.1	85.0	89.7	*77.1**	94.7	*94.4**	N/A	89.3	90.6
Teaching about office tools	77.1	61.3	78.3	*69.4**	70.2	*69.4**	N/A	75.8	78.1
Collaborative and productive work by pupils	73.3	80.5	72.6	*77.1**	75.4	*80.6**	N/A	69.6	76.0
Computer/internet should not be used for any of these in teaching	1.9	0.6	2.0	*0.0**	1.8	*0.0**	N/A	2.8	1.2

Source: *LearnInd CTS 2006;* ***Base:*** *all teachers;* ***Question:*** *Q13: "What do you think for what computers and the internet should be used for in teaching?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Access, Competence and Motivation for Using ICT and the Internet in Schools

Access

The majority of Icelandic teachers are more or less satisfied with the technical access means at their schools: 77% state that their school is well-equipped with computers and 78% express the opinion that their internet connection is fast enough. Only 35% wish there were better ICT support and maintenance actions taken. This is the by far lowest figure in Europe and demonstrates the very good level of ICT equipment and related service provision in Icelandic schools.

In terms of content a minority of 37% state problems with respect to finding adequate learning materials and 40% argue that existing materials are of poor quality.

Competence in using ICT

Icelandic teachers feel most competent at using e-mail and using a text processor programme but are less confident with downloading and installing software and with using presentation software packages. The figures are around the EU25 average.

Lower level school teachers (39% in primary and 50% in lower secondary schools) seem to be less ICT competent than those in upper secondary and vocational schools (31%).

Motivation for ICT use in Schools

Less than on average in Europe (86%) but nevertheless a healthy 73% of Icelandic teachers see significant learning benefits for pupils using computers in class and say that pupils are more motivated and attentive when computers and the internet are used in class.

However, a very high 47% express the opinion that using ICT in class does not reveal significant benefits for pupils, i.e. are not very motivated for ICT use in class. This is the case at equal levels in all school types. Only teachers in Sweden and Spain are more sceptical with respect to the benefits for pupils when using ICT in class.

ICT Readiness of Teachers – the ACM Model

The ACM model as developed by Viherä and Nurmela (2001)[3] was applied in LearnInd to generate a typology according to the “propensity to the use of computers and internet by teachers in classroom situations at schools”.

The typology in the figure below takes account of the three main categories of preconditions which need to be given for a school to make use of computers and the internet in the teaching process in classrooms, computer labs etc.

Teachers' access, competence and motivation for using ICT in class 2006

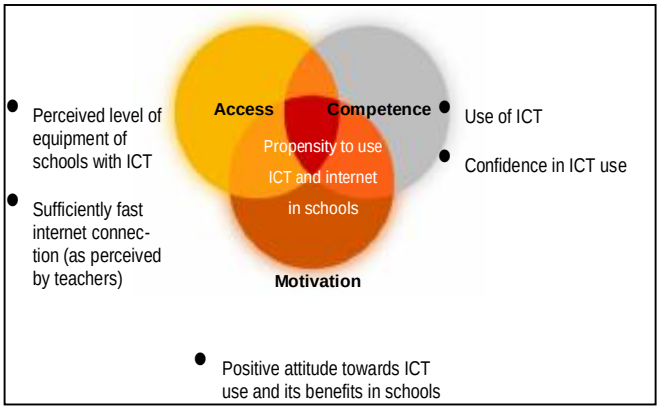
Percentage of teachers agreeing or strongly agreeing:	Total IS	Total EU25	Educational Level: Primary	Lower secondary	Upper secondary	Vocational	Subject of teaching: General primary	Literature and languages	Humanities and social sciences	Science, maths, computer sciences	Physical, artistic, crafts education	Vocational education
Access												
Our school is well equipped with computers [a]	77.4	74.2	75.5	*84.6**	89.5	*88.9**	76.7	78.4	*81.1**	75.5	77.0	*77.8**
The internet connection we have is sufficiently fast [b]	77.8	77.2	75.3	*84.7**	94.7	*91.4**	78.6	72.3	*83.8**	80.0	75.6	*83.3**
Better technical maintenance and support is required in our school [c]	35.4	64.8	38.3	*23.0**	19.3	*22.2**	43.3	32.9	*29.8**	32.9	33.4	*36.9**
Existing teaching materials on the Internet are of poor quality [d]	39.7	29.9	37.6	*54.5**	*51.0**	*50.0**	32.5	41.2	*35.2**	38.0	43.7	*50.0**
It is hard to find adequate learning materials for teaching [e]	36.6	38.7	35.1	*61.4**	38.6	*42.9**	30.9	35.7	*37.2**	35.3	40.5	*43.8**
Motivation												
Pupils are more motivated and attentive when computers and the internet are used in class [f]	73.3	86.3	75.8	*84.5**	*53.2**	*60.7**	77.4	71.1	*71.9**	72.6	74.2	*76.9**
Using computers in class does not have significant learning benefits for pupils [g]	46.9	20.7	47.0	*45.3**	*48.9**	*40.0**	49.0	50.0	*31.2**	44.5	42.4	*46.1**
Competence												
Teachers in our school do not have sufficient computer skills [h]	37.9	42.0	38.5	*50.0**	*31.3**	*31.3**	39.8	32.6	*26.5**	43.5	43.0	*50.0**
Competence / computer skills (Percentage of teachers who feel very confident at…)												
Using text processors [i]	77.1	65.0	74.6	*91.0**	*87.5**	*83.3**	73.4	76.3	*75.7**	83.3	77.3	*66.7**
Creating electronic presentations [j]	46.6	34.0	41.3	*54.7**	*75.0**	*63.3**	34.9	45.9	*54.5**	59.2	35.8	*50.1**
Using e-mail [k]	74.8	65.9	73.9	*63.7**	*83.3**	*76.7**	72.5	72.6	*81.8**	79.6	69.8	*58.4**
Downloading and installing software [l]	21.1	35.8	19.2	*9.1**	*33.3**	*33.3**	16.5	14.1	*21.2**	29.6	26.4	*25.0**

Source: *LearnInd CTS 2006;* ***Base:*** *a-h All teachers; i -l Teachers using computers in class* ***Question:*** *a-h Q14, i-l Q11.* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

These are: access (to computers and the internet at school), competence (in using the computer software and the internet, and applying it for teaching purposes), and motivation (gauged through the attitude that using computers in classrooms results in significant learning benefits).

Any attempt to group the classroom teachers according to their propensity to becoming users of computers and the internet in their teaching processes needs to take account of these three dimensions. In the present application of the ACM model data from the Classroom Teacher Survey (CTS) was used. Therefore "access" for instance is to be understood as a perceived level of computer equipment at schools and teachers' satisfaction therewith rather than an objective measure of equipment status.

The Access-Competence-Motivation Model



38% of European teachers dispose of sufficient access to the internet at school, the necessary competence in using ICT in class and are motivated to its use.

With a surprising only 18% of the teachers belonging to this group, Iceland ranks at the second last position in Europe. The situation is only poorer in Latvia. Overall the UK with 60% ranks top and Latvia with 15% finds itself at the very end. Icelandic teachers also seem to be very competent in using ICT in class. The corresponding figure for Iceland is more than twice as high as the European average and by far the highest in Europe.

Access, Motivation and Competence of Teachers for Using ICT in Schools in Iceland 2006

IS	EU25	Access	Competence	Motivation
6.1	4.3	~~Access~~	~~Competence~~	~~Motivation~~
5.4	3.9	**Access**	~~Competence~~	~~Motivation~~
21.5	9.7	~~Access~~	**Competence**	~~Motivation~~
0.9	5.0	~~Access~~	~~Competence~~	**Motivation**
37.0	13.7	**Access**	**Competence**	~~Motivation~~
0.9	4.8	**Access**	~~Competence~~	**Motivation**
10.2	20.7	~~Access~~	**Competence**	**Motivation**
17.9	37.9	**Access**	**Competence**	**Motivation**
100	100			

Percentage of teachers. ***Source:*** *LeanInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *See endnote* [4]

The as yet insufficient internet connection in many schools and a lack of motivation of teachers for using ICT are the most critical issues for a wider uptake of computers and the internet in schools in Europe. 20% of European teachers indicate insufficient computer equipment and the low speed of internet connection in their school as a key barrier. 14% show a lack of motivation, i.e., they are of the opinion that using computers in class does not result in significant learning benefits.

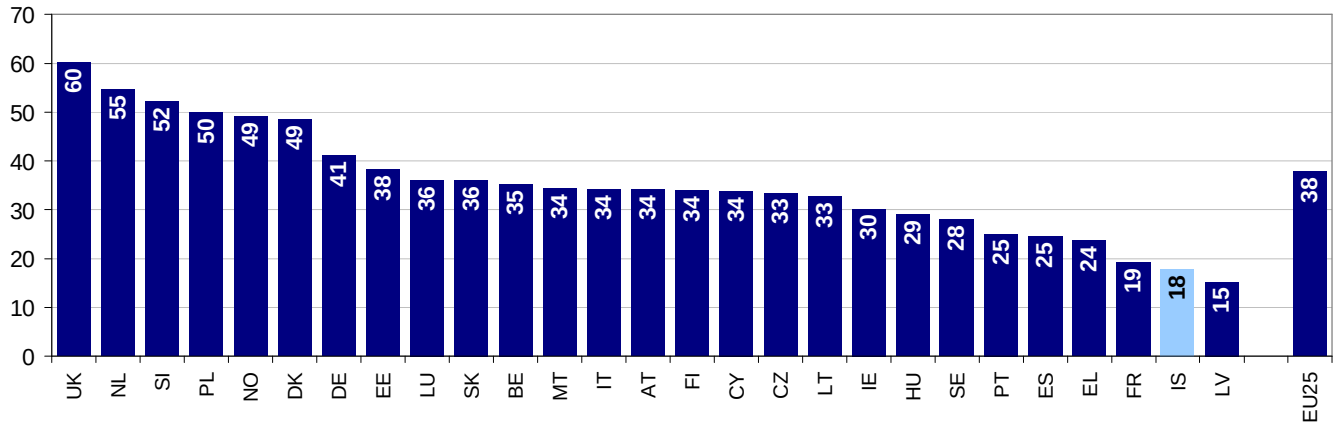
The situation in Iceland is different. Lack of ICT access does not constitute a problem in Iceland. However, lack of motivation of teachers does. A very high (the high-

est in Europe) 37% of teachers with the necessary ICT access and ICT skills are not motivated to its use in class.

This result, coupled with the small number of teachers who dispose of sufficient access to the internet at school, the necessary competence in using ICT in class and are motivated to its use shows that further action may be required to increase the motivation of teachers to use ICT in class.

However, a word of caution is needed here. One has to bear in mind that the results for Iceland are based on rather small sample sizes and many of the results are based on expression of opinions by teachers themselves which can vary substantially in terms of appropriateness and reliability across countries.

ICT Readiness of Teachers in Iceland: Percentage of Teachers Fully Ready to use Computers in Class (ACM Indicator) 2006



Source: *LeanInd CTS 2006;* ***Base:*** *All teachers.* ***Question:*** *See endnote 5*

ANNEXES

Methodology Report

Universe / Sample population

In order to assure the comparability of school levels in all countries UIS-OECD-EUROSTAT "Mapping of national education programmes to ISCED 97 for school academic/year 2002/2003" [5] was used for composing the sample frame. Based on this, each country divided its school system into ICSED codes and made different combinations that existed in its country.

Sampling frame and method

The sample was composed using official databases, which contained contact data of schools. In the majority of countries the sample was drawn from a database received from the Ministry of Education.

For each country a separate template of sample frames was composed by TNS Emor. These templates contained data about school types across regions as well as location type. School types were defined based on the ISCED codes provided in UIS-OECD-EUROSTAT. Location type distribution was made according to the Eurostat type of locality classification which differentiates densely populated, intermediate and thinly populated municipalities[6]. Apart from that, each country was divided into 3-7 regions depending on the size of a country.

Based on the data provided by countries, TNS Emor composed quotas for each country. Two level stratification was used – quotas for first stage, random sample for second. The quotation for region by school type and location type was endorsed. Simple random selection was conducted by the local agency or the local source of the contact base. Both private and public schools were included in the sample. It was also obligatory to include schools of other teaching languages than the official language of a country in the sample.

Simple random sampling was used inside a quota cell. This means that if the quota for primary schools in region1 was 100 and the total number of primary school in this region was 800, then a random sample selection was be made among those 800 schools. This covered also both private and public schools and schools of other teaching languages than the official language of a country.

No more than 50% of interviews could be made in one school level. At least 10% of respondents had to be from schools which provided professional/vocational or combined programme of vocational and upper secondary level education (in case a country did not have special quota for those schools). It did not matter whether vocational education level was coded as ISCED 3 or ISCED 4.

There were no duplications in samples of head teacher and classroom teacher surveys. This was only allowed in countries with small universe sizes (e.g. Malta, Cyprus, Iceland, Estonia, Latvia etc) and in cases where the last quota cells were very difficult to achieve or there were not enough schools of a certain type. The priority was to include as many different schools as possible. In both surveys, 5 attempts were made before giving up and only if the respondent refused was this person not contacted again.

The CATI programme generated a randomly chosen letter. The interviewer asked for the person with a surname that started on the generated letter. If there was more than one teacher whose surname started with the selected letter, the person who was first alphabetically was chosen. If the correct person was not available, an appointment was made. At least 5 attempts were made, before taking another teacher.

Only in Malta, due to instructions dictated by the Education Department, would the Head Teacher randomly select a teacher who would be available for an appointment during which they would be interviewed.

Number of interviews conducted (HTS / CTS)

Country		Head Teachers	Classroom teachers
BE	Belgium	450	807
CZ	Czech Republic	500	1000
DK	Denmark	315	848
DE	Germany	450	901
EE	Estonia	400	851
EL	Greece	500	1000
ES	Spain	518	1022
FR	France	501	869
IE	Ireland	403	626
IT	Italy	500	900
CY	Cyprus	150	600
LV	Latvia	451	902
LT	Lithuania	457	908
LU	Luxemburg	82	277
HU	Hungary	500	1000
MT	Malta	100	200
NL	Netherlands	515	890
AT	Austria	320	450
PL	Poland	500	1000
PT	Portugal	450	900
SI	Slovenia	253	460
SK	Slovakia	502	1000
FI	Finland	318	601
SE	Sweden	200	450
UK	United Kingdom	450	905
IS	Iceland	177	424
NO	Norway	494	708
TOTAL		**10456**	**20499**

Fieldwork

Fieldwork was coordinated by the TNS Emor and conducted in cooperation with its local TNS offices excluding Iceland, Cyprus, Austria, Slovenia and Malta where TNS does not have offices. In these countries partners with whom TNS had previous experience were used.

Pilot interviews prior to the regular fieldwork were conducted with 20 schools in both target groups in Estonia and Greece in February 2006, in order to test the questionnaire (structure, comprehensibility of questions).

Between March and April 2006, surveys among head teachers (head teacher survey - HTS) and classroom teachers (CTS) were carried out in 27 European countries. TNS Emor was responsible for the fieldwork.

Weighting schemes

After the fieldwork, weighting coefficients were computed using region, location type and school type.

Statistical accuracy of the survey: confidence intervals

Statistics vary in their accuracy, depending on the kind of data and sources. A "confidence interval" is a measure that helps to assess the accuracy that can be expected from data. The confidence interval is the estimated range of values on a certain level of probability of error. Confidence intervals for estimates of a population fraction (percentages) depend on the sample size, the probability of error, and the survey result (value of the percentage) itself. Further to this, variance of the weighting factors has negative effects on confidence intervals.

The calculation of confidence intervals is based on the assumption of (quasi-) infinite population universes. In practice, however, in some countries and for some school levels the complete population of schools consists of only several hundred or even a few dozen of schools. In some cases, literally each and every school within a country-school type cell was contacted and asked to participate in the survey. This means that it is practically impossible to achieve a higher confidence interval through representative school surveys in which participation is not obligatory.

Country Background Data

Iceland is the by far smallest country in Europe, with a high total fertility rate, an outstanding life expectancy and a remarkable number of inhabitants aged 0-14. 35 % of public expenditure on education is spent on primary schools, which is top in Europe.

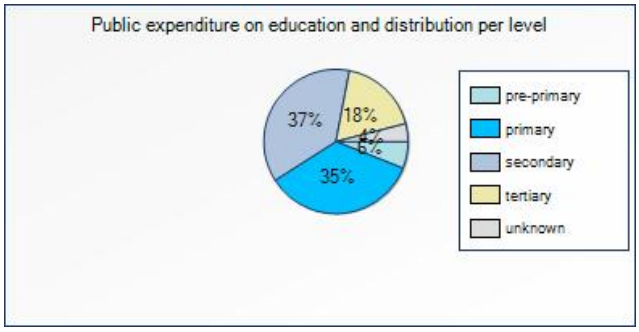
General Population Data for Iceland 2002/03[7]

Total population (000)	287
Annual population growth rate (%)*	1
Population 0-14 years (%)	23
Rural population (%)*	7
Total fertility rate (births per woman) *	1.9
Infant mortality rate (0/00) *	3
Life expectancy at birth (years) *	80
GDP per capita (PPP) US$ *	29,697
GDP growth rate (%)*	-0.5
* World Bank World Development Indicators	

Resources for Education in Iceland 2002/03

Pupil / teacher ratio (primary)	11
Public expenditure on education :	
as % of GDP	7.6
as % of total government expenditure	
Distribution of public expenditure per level (%):	
pre-primary	6
primary	35
secondary	37
tertiary	18
unknown	4

Resources for Education in Iceland 2002/03



The Educational System in Iceland[8]

Compulsory education is organised for pupils between the ages of 6 and 16. Young people of compulsory education age numbered 44,511 in the autumn of 2004, out of a population of 293,577, i.e. 15.2%. In 2004 the number of children between the ages of 3 and 5 in pre-primary education was 11,881, which is around 94% of these age cohorts. In the same year 93% of the age cohort 16, 83% of the age cohort 17, 75% of the age cohort 18 and 70% of the age cohort 19 were enrolled in upper secondary education. The number of students enrolled in higher education institutions in Iceland was 15,390 in 2004 or 5.2% of the total population. A considerable number of Icelandic higher education students study abroad, or approximately 2,000. The language of instruction is Icelandic.

The Icelandic parliament is legally and politically responsible for the educational system, and determines its basic objectives and administrative framework. All education is under the jurisdiction of the Ministry of Education, Science and Culture, with the exception of two higher education institutions specialising in the field of agriculture that come under the auspices of the Ministry of Agriculture.

The educational system has to a large extent been decentralised, both with regard to responsibilities and decision-making. This reflects a general trend in Icelandic society. Local municipalities are responsible for the operation of pre-primary, primary and lower secondary schools. On the other hand, the state operates most upper secondary schools and higher education institutions.

Education in Iceland has traditionally been organised within the public sector, and there are few private institutions in the school system. Almost all private schools receive public funding. There is no national inspectorate. The Ministry of Education, Science and Culture is responsible

for evaluation and supervision of education at all educational levels.

The use of ICT in Education[9]

The Ministry of Education, Science and Culture's Action Plan for eLearning 2005-2008 entails information technology being utilised for the benefit of education and culture to create an advantage for the Icelandic nation in the economy of the future.

Efforts have been devoted to strengthening the premises for using the technology in education. The online educational gateway, www.menntagatt.is, was opened in 2003, with information on the points of focus in education and information technology to be expanded and promoted by the Ministry. Decentralised studies and distance learning with help from ICT, which has solved the big problem of offering education to those in rural areas, specifically general academic education, does not serve to work as well in more technical fields of study.

The curriculum for Icelandic schools is constantly being revised, with consideration taken for altered emphases and needs each time. Revisions involve all areas of the school environment including key competencies, as that concept has been described by Working Group B on basic skills, foreign language teaching and entrepreneurship. For example, in the core curriculum for compulsory and upper secondary schools, published in 1999, much emphasis is placed on key competencies in the use of information and communication technology (ICT) in all areas of study.

The Study

There is a lack of information on the actual use of ICT for learning in schools and for supporting political action in potential future programmes. It is necessary to clarify matters such as the educational vision of heads of schools, the current impact of ICTs on teachers' practice, support and training and on other factors for success in e-learning.

The objective of the study is to obtain estimates for the eEurope 2005 indicator on e-learning "number of pupils per computer with Internet connection (broadband/non-broadband)" and relate it to other possible indicators of educational use of ICT in compulsory education (e-learning in schools). The study looks at how Information and Communication Technologies (ICT) are used in schools.

The study is a continuation of the earlier benchmarking exercise for eEurope 2002.

It involved two surveys. Firstly of head teachers to obtain information on the schools and then of teachers to focus on their use of ICTs in the teaching process

This exercise is part of the Information Society monitoring and benchmarking process for which the Commission in cooperation with the Council defined benchmarking indicators.

Country Briefs

This document has been prepared by **empirica** based on own desk research and the above mentioned primary data sources: Head Teacher Survey (HTS) 2006 and Classroom Teacher Survey (CTS) 2006 in the EU25 member states, Iceland and Norway.

Altogether 27 LearnInd Country Briefs are available in a common format, one for each member of the enlarged European Union, Norway and Iceland.

Also a final report has been developed. It includes approximately 100 exhibits, more than 250 data tables and a report about the key results.

You can access and download these documents in PDF format (for free) from http://ec.europa.eu/information_society/eeurope/i2010/benchmarking/index_en.htm.

More information

Check our results and achievements on: http://ec.europa.eu/information_society/eeurope/i2010/benchmarking/index_en.htm. If you wish to be provided with more details, or to receive news and updates, please contact us at: **learnind@empirica.com** or get in touch with us.

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1 Note that "in class" means during lessons while teaching and does not denote a particular location such as a classroom.

2 Base (100%) = all teachers who have used a computer in class in the last 12 months.

3 Viherä, M-L, Nurmela, J (2001) "Communication Capability Is an Intrinsic Determinant for Information Age", in Futures, Volume 33, Issue 3-4:245-265.

4 Synthetic indicators: Access: Q14 (2) "Our school is well equipped with computers" and Q14 (3) "The internet connection we have is sufficiently fast ".

Competence: Q11 How confident do you feel... a) using a text processor, b) creating a presentation c) using e-mail, d) downloading and installing software. Threshold: Average of 2.5 or more on a 1-4 confidence scale

Motivation: Q14 (8); disagree to "Using computers in class does not result in significant learning benefits".

For full question wordings refer to questionnaire.

5 http://forum.europa.eu.int/Public/irc/dsis/edtcs/library?l=/public/unesco_collection/programmes_isced97&vm=detailed&sb=Title

6 Densely populated area refers to a set of closely related local units, each one of which having a density greater than 500 inhabitants per km2, and the total population of which being of at least 50 000 inhabitants; Intermediate area refers to a set of closely related local units that do not pertain to a densely populated area, each one of which having density greater than 100 inhabitants per km2, and where the total population is at least of 50 000 inhabitants or it refers to a set that is adjacent to a highly populated area. Thinly populated area (rural): refers to a set of closely related local units that are not part of a densely populated area, or of an intermediate area. (A set of local areas totalling less than 100 km², not reaching the required density, but entirely enclosed within a densely-populated or intermediate area, is to be considered to form part of that area. If it is enclosed within a densely-populated area and an intermediate area it is considered to form part of the intermediate area).

7 Source: http://www.uis.unesco.org/profiles/selectCountry_en.aspx (visited 28 March 2006)

8 Source: http://www.eurydice.org/Documents/struct2/frameset_EN.html (visited: 28 March 2006)

9 Source: http://europa.eu.int/comm/education/policies/2010/nationalreport_en.html (visited: 9 May 2006)